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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,221	10/31/2003	Hisashi Minemoto	10873.1337US01	1493
23552	7590	03/17/2004	EXAMINER	
MERCHANT & GOULD PC P.O. BOX 2903 MINNEAPOLIS, MN 55402-0903			THOMAS, BRANDI N	
			ART UNIT	PAPER NUMBER
			2873	
DATE MAILED: 03/17/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/698,221

Applicant(s)

MINEMOTO ET AL.

Examiner

Brandi N Thomas

Art Unit

2873

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other: Detailed Action.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. Acknowledgement is made of receipt of Information Disclosure Statement(s) (PTO-1449) filed 1/26/04. An initialed copy is attached to this Office Action.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-8 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satorius (6151427) in view of being well known in the art in further view of Mizutani et al. (5801389).

Regarding claim 1, Satorius teaches an ultraviolet acoustooptic device, comprising: a radio-frequency signal input part (signal from first signal generator); a transducer unit (44) for converting a radio-frequency signal into a mechanical vibration (col. 5, lines 43-48); an acoustooptic medium whose optical characteristic varies according to the mechanical vibration

Art Unit: 2873

(col. 5, lines 53-61) but does not specifically show the acoustooptic medium having a wavelength of 380 nm or shorter. However it would be obvious to construct the acoustooptic medium to have a wavelength of 380 nm or shorter, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable range involves only routine skill in the art (*In re Aller*, 105 USPQ 233). It would have been obvious to someone of ordinary skill in the art at the time the invention was made to construct the acoustooptic medium to have a wavelength of 380 nm or shorter for the purpose of the ultraviolet range on the spectrum is a range of 315 to 400 nanometers. Satorius also does not show the acoustooptic medium is formed of an oxide single crystal containing at least boron as a component of its unit cell, a LiNbO_3 crystal, or a LiNbO_3 crystal doped with MgO. Mizutani et al. shows that it is known to provide a single oxide crystal composed of a LiNbO_3 crystal, or a LiNbO_3 crystal doped with MgO for the use of a transducer to generate ultrasonic waves (col. 17, lines 10-11 and 37-40). Therefore it would have been obvious to someone of ordinary skill in the art at the time the invention was made to combine the teaching of Satorius with the crystal of Mizutani et al. for the purpose of the using a transducer to generate ultrasonic waves (col. 17, lines 10-11 and 37-40).

Regarding claim 2, Mizutani et al. discloses wherein the oxide single crystal contains at least alkali metal or alkaline-earth metal as a component of its unit cell (col. 17, line 36).

Regarding claims 3-6, Satorius and Mizutani et al. discloses the claimed invention except for the oxide single crystal containing at least boron as a component of its unit cell is at least one of single crystals selected from a group including $\text{Li}_2\text{B}_4\text{O}_7$, $\text{CsLiB}_6\text{O}_{10}$, $\text{LaCa}_4\text{O}(\text{B}_3\text{O}_3)_3$, LiB_3O_5 , $\alpha\text{-BaB}_2\text{O}_4$, and $\beta\text{-BaB}_2\text{O}_4$ and wherein the oxide single crystal is a $\text{Li}_2\text{B}_4\text{O}_7$ or

Art Unit: 2873

CsLiB₆O₁₀ single crystal and wherein the oxide single crystal further contains a rare earth element as a component of its unit cell is at least one single crystal selected from a group including (GdY)₁Ca₄O(BO₃)₃ and YCa₄O(BO₃)₃. It is obvious to make the oxide crystal of the those elements listed above, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use (In re Leshin, 125 USPQ 416). It would have been obvious to someone of ordinary skill in the art at the time the invention was made to make the oxide crystal of the those elements listed above for the purpose of using a transducer to generate ultrasonic waves.

Regarding claims 7 and 8, Satorius and Mitzutani et al. discloses the claimed invention except using MgO. It is obvious to use MgO since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use (In re Leshin, 125 USPQ 416). It would have been obvious to someone of ordinary skill in the art at the time the invention was made to use MgO for the purpose their acceptable use as optical materials for UV-light lasers. Satorius and Mitzutani et al. also do not teach a doping amount of MgO is 7 mol. % or less and 0.5 mol. % to 7 mol.%. It is obvious to doping amount of MgO is 7 mol. % or less and 0.5 mol. % to 7 mol.%, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (In re Aller, 105 USPQ 233). It would have been obvious to someone of ordinary skill in the art at the time the invention was made to use a doping amount of MgO is 7 mol. % or less and 0.5 mol. % to 7 mol.% for the purpose of using it as a buffer layer for epitaxial growth.

Art Unit: 2873

Regarding claim 11, Satorius and Mitzutani et al. discloses the claimed invention but does not specifically show the acoustooptic medium having a wavelength of 380 nm or shorter. However it would be obvious to construct the acoustooptic medium to have a wavelength of 380 nm or shorter, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable range involves only routine skill in the art (In re Aller, 105 USPQ 233).

5. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satorius (6151427) in view of being well known in the art in further in view of Mizutani et al. (5801389) as applied to claim 1 above, and further in view of Gaida et al. (4610754).

Regarding claims 9 and 10, Satorius and Mitzutani et al. discloses the claimed invention except for at least a part of the acoustooptic medium further is covered with a high thermal conductive sheet made of graphite. Gaida et al. graphite shows that it is known to provide a high thermal conductive sheet made of graphite to inhibit reactions between the base and the metallic material (col. 4, lines7-10). Therefore it would have been obvious to someone of ordinary skill in the art at the time the invention was made to combine the teaching of Satorius and Mitzutani et al. with the graphite sheet of Gaida et al. for the purpose of to inhibit reactions between the base and the metallic material (col. 4, lines7-10).

6. Claims 12-15, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Welmers et al. (4661699) in view of being well known in the art in further in view of Mizutani et al. (5801389).

Art Unit: 2873

Regarding claim 12, Welmers et al. discloses, in figure 1, an optical imaging apparatus, comprising: a light source (14) for emitting light (col. 3, lines 29-31) but does not specifically show the acoustooptic medium having a wavelength of 380 nm or shorter. However it would be obvious to construct the acoustooptic medium to have a wavelength of 380 nm or shorter, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable range involves only routine skill in the art (In re Aller, 105 USPQ 233); an ultraviolet acoustooptic device (16) for diffracting light emitted from the light source (col. 3, lines 31-32); a driving circuit (50); and an image plane (36) on which light diffracted by the ultraviolet acoustooptic device forms an image does not show the acoustooptic medium is formed of an oxide single crystal containing at least boron as a component of its unit cell, a LiNbO_3 crystal, or a LiNbO_3 crystal doped with MgO. Mizutani et al. shows that it is known to provide a single oxide crystal composed of a LiNbO_3 crystal, or a LiNbO_3 crystal doped with MgO for the use of a transducer to generate ultrasonic waves (col. 17, lines 10-11 and 37-40). Therefore it would have been obvious to someone of ordinary skill in the art at the time the invention was made to combine the teaching of Satorius with the crystal of Mizutani et al. for the purpose of the using a transducer to generate ultrasonic waves (col. 17, lines 10-11 and 37-40).

Regarding claim 13, Mizutani et al. discloses wherein the oxide single crystal contains at least alkali metal or alkaline-earth metal as a component of its unit cell (col. 17, line 36).

Regarding claim 14, Welmers et al. and Mizutani et al. discloses the claimed invention except for the oxide single crystal containing at least boron as a component of its unit cell is at least one of single crystals selected from a group including $\text{Li}_2\text{B}_4\text{O}_7$, $(\text{GdY})_1\text{Ca}_4\text{O}(\text{BO}_3)_3$,

Art Unit: 2873

$\text{CsLiB}_6\text{O}_{10}$, $\text{YCa}_4\text{O}(\text{BO}_3)_3$, $\text{LaCa}_4\text{O}(\text{BO}_3)_3$, LiB_3O_5 , $\alpha\text{-BaB}_2\text{O}_4$, and $\beta\text{-BaB}_2\text{O}_4$. It is obvious to make the oxide crystal of the those elements listed above, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use (In re Leshin, 125 USPQ 416). It would have been obvious to someone of ordinary skill in the art at the time the invention was made to make the oxide crystal of the those elements listed above for the purpose of using a transducer to generate ultrasonic waves.

Regarding claim 15, Welmers et al. discloses an optical imaging apparatus further comprising a movable mirror (34) for forming an image on the image plane with the light diffracted by the ultraviolet acoustooptic device (col. 4, lines 15-19), with the movable mirror (34) being disposed between the ultraviolet acoustooptic device and the image plane (figure 1).

Regarding claim 18, Welmers et al. discloses an optical imaging apparatus further comprising a beam stopper (30) for shielding light transmitted through the ultraviolet acoustooptic device, with the beam stopper being disposed on a side where the light transmitted through the ultraviolet acoustooptic device travels (col. 3, lines 66-68 and figure 1).

Regarding claim 19, Welmers et al. discloses the claimed invention except for the image plane being a photoreceptor. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a photoreceptor for the purpose of turning light energy into electrical pulses.

7. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gaida et al. (4610754) in view of being well known in the art in further in view of Mizutani et al. (5801389) as applied to claim 1 above, and further in view of Gaida et al. (4610754).

Art Unit: 2873

Regarding claims 16 and 17, Gaida et al. and Mitzutani et al. discloses the claimed invention except for at least a part of the acoustooptic medium further is covered with a high thermal conductive sheet made of graphite. Gaida et al. graphite shows that it is known to provide a high thermal conductive sheet made of graphite to inhibit reactions between the base and the metallic material (col. 4, lines7-10). Therefore it would have been obvious to someone of ordinary skill in the art at the time the invention was made to combine the teaching of Satorius and Mitzutani et al. with the graphite sheet of Gaida et al. for the purpose of to inhibit reactions between the base and the metallic material (col. 4, lines7-10).

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Yamamoto (3818129) discloses an imaging device in which a spatial picture corresponding to an original picture is reproduced.

Amano (4843335) discloses an acoustooptic modulation device including a plurality of split light beams form a beam splitter in response to a single incident light beam.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brandi N Thomas whose telephone number is 571-272-2341. The examiner can normally be reached on 8-5.

Art Unit: 2873

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 571-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


BNT


RICKY MACK
PRIMARY EXAMINER